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# Connecticut Agricultural Experiment Station.

NEW HAVEN, CONN.

## BULLETIN No. 100.

SEPTEMBER, 1889

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*The Bulletins and Reports of this Station are mailed free to every citizen of Connecticut who applies for them.*

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### THIS BULLETIN CONTAINS

1st. An analysis of Sylvanit, a potash salt.

2d. Analyses of unleached wood ashes, with data regarding their average composition and notes on their agricultural use.

3d. Analyses and valuations of all the samples of commercial mixed fertilizers—nitrogenous superphosphates, guanos and special manures—which have been drawn by the Station Agents during the last season.

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A summary of the Bulletin will be found on the last page.

## SYLVANIT.

This is a product of the Stassfurt potash industry which is used by manufacturers of mixed fertilizers and may be offered in the retail trade. Like kainit it is offered as a "Sulphate of Potash," but like kainit also, it cannot be properly regarded as such, for it does not contain enough sulphuric acid to combine with all the potash present, and moreover, contains between three and four times as much chlorine as sulphuric acid. A sample drawn from a single bag in New York City had the following composition :

Water .....	7.25
Potash .....	16.65
Soda .....	27.10
Lime .....	2.08
Magnesia .....	3.37
Sulphuric acid .....	11.06
Chlorine .....	41.35
Matters insoluble in water .....	.74
	109.60
Deduct oxygen equivalent to chlorine .....	9.34
	100.26

Sylvanit contains rather more potash than kainit and consists of sulphates and muriates of potash and soda, the muriates preponderating.

## UNLEACHED WOOD ASHES.

Large quantities of unleached wood ashes are now brought into Connecticut yearly from Canada and the northwestern states and are sold for from \$11 to \$15 per ton, in car lots.

The following analyses have been made of ashes brought into the State this year :

**2537.** Canada Ashes. Bought by N. S. Platt, Cheshire, from James Hartness, Detroit, Mich. Cost, 23 cents per bushel.

**2587.** Sampled and sent by F. A. Griswold, Wethersfield. Bought in Hartford.

**2620.** Screened Ashes. Bought by C. S. Gillette, Cheshire, from W. E. Fyfe & Co., Clinton, Mass. Cost, \$11.00 per ton, in car lots at Cheshire.

**2624.** Canada Ashes, sampled and sent by G. L. Dunham, Southington, from stock of Burritt Hills, Plainville. Cost, \$11.00 per ton. One bushel weighs  $57\frac{1}{2}$  pounds.

**2628.** Canada Ashes. Sold by Munroe, Judson & Stroup, Oswego, N. Y., to Atwood & Wilson, Watertown. Sampled and sent by D. B. Thompson, Watertown. Cost, \$15.00 per ton.

**2632.** Sold by Forest City Wood Ash Co., London, Ont., Canada, to F. N. Bradley, Derby. Cost, \$13.00 per ton.

ANALYSES.

	2537	2587	2620	2624	2628	2632
Potash, soluble in water	4.48	4.01	3.77	4.91	5.33	6.04
Phosphoric acid	1.77	1.05	1.70	1.77	1.19	1.32
Lime			31.55	25.90	44.54	39.02
Carbonic acid			18.26	18.30	26.46	19.60
Sand and insoluble matters			16.25	25.65	8.45	12.38

The sample **2628** is fine and nearly white. The question was asked whether it was not mixed with lime. Such is perhaps the case, the high per cent. of lime being offset by the low percentage of sand and insoluble matters.

Ashes vary a good deal in composition, and some of the samples received this year are notably deficient in potash.

The following data show the average quality of ashes. 91 samples of unleached wood ashes, analyzed by Dr. Goessmann, of Massachusetts, between the years 1868 and 1889 (Rep. Mass. Ex. St., 1888, 202, and Bull. 33), had the following average composition :

	Average.	Maximum.	Minimum.
Potash	5.5	10.2	2.5
Phosphoric acid	1.9	4.0	.3
Lime	34.3	50.9	18.0
Magnesia	3.5	7.5	2.3
Insoluble matter	12.9	27.9	2.1
Moisture	12.0	28.6	.7

16 analyses made at the Connecticut Station between 1877 and 1889 had the following average composition :

	Average.	Maximum.	Minimum.
Potash	5.3	7.7	4.0
Phosphoric acid	1.4	1.8	1.0

The ashes from household fires in New England appear to be richer both in phosphoric acid and potash. 15 analyses, 13 of which were made by Prof. Storer, of the Bussey Institution, show the following average composition :

Potash	-----	-----	9.63
Phosphoric acid	-----	-----	2.32

The quality as well as the quantity of ashes from a given weight of wood depends very much on the kind of wood as well as on its freedom from dirt, etc.

A valuable series of analyses recently made at the Georgia Experiment Station illustrates this. According to the analyses, 10,000 pounds of several different varieties of wood, [exclusive of bark and having a uniform water content], contained the following quantities of the ingredients named. The samples were selected from trees growing as nearly as possible under like conditions and of medium age. [See table of analyses on page 5.]

The facts that these analyses are of the wood only, bark being removed, that the bark contains much less of these ingredients than the wood, and that these ashes were pure—free from all sand or earth as well as carbonic acid—will explain why the percentages are so much higher than are found in analyses of ashes in market.

Leached and unleached Canada ashes have approximately the following percentage composition :

	Unleached Ashes.	Leached Ashes.
Sand earth and charcoal.....	13.0	13.0
Moisture.....	12.0	39.0
Carbonate with some hydrate of lime.....	61.0	51.0
Potash [chiefly as carbonate].....	5.5	1.1
Phosphoric acid.....	1.9	1.4
Other matters by difference.....	6.6	3.5
	<hr/> 100.0	<hr/> 100.0

It appears from this statement that more than half the weight of both leached and unleached ashes consists of lime, partly as hydrate but chiefly as carbonate; the same material chemically as chalk or limestone but finer and so likely to be quicker in its action.

It has long been known that chalk or limestone may benefit both very heavy and very light lands making the one looser in texture and less apt to puddle and the other closer and more compact. It does this in the one case by separating the particles of sticky clay and in the other by filling up the interspaces of a coarse soil. A writer on agriculture in the early part of the last century says of chalk, "it causes great fertility especially on such lands as are apt to lose the riches of dungs laid on them, and to forget in a little time that they have had any kind and indulgent benefactor. Here chalk is of excellent use to drive away such ingratitude, having a retentive quality to enclose and stay the salts."

It needs to be borne in mind that potash or soda lye binds a clay soil making it heavier, more tenacious and cloddy than before, and it may be that on this account a heavy application of *unleached* ashes to a clay soil would either not help it at all or even damage it, while on light soils unleached ashes would be more beneficial than leached ashes. This favorable action on light soils has made ashes popular in this State where our soil is for the most part light and sandy. They "keep the soil moist" as the saying is, that is by filling up the pores and compacting it, the soil water is made to rise more readily in it from the subsoil bringing plant food with it and preventing drought.

Besides this action of ashes which is in large part at least mechanical, they also tend to correct "sourness" of the soil. In most cases this is not due to free acid but to the presence of soluble iron salts which in undue quantity are poisonous to plants and in smaller quantity show that the soil is stagnant, and needs aeration. Ashes precipitate these salts and open the soil that contains them to the air, by making it looser in texture.

When potash salts have been used in large quantities and the potash has been largely taken up by a rapidly growing crop as tobacco, leaving most of the acid with which the potash was combined in the soil, ashes or lime may profitably be used to neutralize it. Our best tobacco growers use stone lime or cotton hull ashes largely on their tobacco land with excellent results.

A third way in which ashes benefit land is in promoting nitrification; that process by which the more or less inert nitrogenous matters in the soil, are made to yield nitrates from which our field crops obtain most if not all their nitrogen supply. This process is in some way connected with the life of low organisms, which are invariably present in fertile soils. Nitric acid can only be produced however when carbonate of lime is present to supply a base with which the acid may combine, and a soil mildly alkaline is the one most favorable to the growth of these organisms and the formation of nitrates.

Such is, in brief, our present knowledge regarding the action of ashes. It is clear that the quantities of potash and phosphoric acid present do not wholly measure the value of ashes nor does it pay to buy them simply to supply a deficiency of these two things in the manure. The quantities of potash and phosphoric acid in a ton of ashes costing \$12 to \$15, can be bought in the form of muriate of potash and superphosphate of

*Ten Thousand Pounds of Wood contained Pounds of the Ingredients named:*

	Dogwood.	Cornus horrida.	Sycamore.	Pecan.	Ash.	Red Oak.	White Oak.	Hickory.	Carya tomentosa.	Magnolia.	Georgia Pine.	Yellow Pine.	P. miltis.	Black Pine.	Castanea vulgaris.	Old Field Pine.	P. miltis.	
Potash	19.02	18.06	16.85	14.94	13.95	13.80	10.60	7.13	5.01	4.54	3.02	2.90	.79					
Phosphoric acid	5.72	9.55	6.96	1.15	5.38	5.83	2.49	3.19	1.24	.96	.92	1.09	.73					
Lime	26.41	24.73	35.61	7.60	27.40	18.40	7.85	14.21	18.04	15.16	12.46	7.93	12.12					
Magnesia	4.67	.49	5.28	.10	3.06	4.86	.90	2.94	2.03	.74	.10	.34	1.17					
The Pure* Ashes of the Woods contained the following Per cents. of the Ingredients named.																		
Potash	28.04	23.17	21.92	46.04	24.66	28.60	42.16	19.54	15.35	19.70	14.30	18.10	3.85					
Phosphoric acid	8.51	12.23	9.00	3.58	10.55	11.97	9.48	8.75	3.82	4.18	4.33	6.76	4.11					
Lime	38.93	31.62	46.39	23.57	48.26	37.94	29.85	38.94	55.24	65.53	58.98	49.18	67.73					
Magnesia	6.80	.62	6.88	.60	5.38	10.04	3.43	8.05	6.25	3.20	.50	2.11	6.54					

\* Free from carbon and carbonic acid.

lime for \$8 or \$9. But ashes temper certain soils making them easier to work, moister, and more retentive of manure, correcting "sourness," promoting the solution of plant food in them and so preparing the way for the use of fertilizers which directly applied might be wasted. To accomplish these ends ashes have to be used in considerable quantity and probably a single heavy dose would help more than the same quantity applied in fractions through three or four successive years if the object is to change the mechanical condition of the soil strikingly.

### COMMERCIAL FERTILIZERS.

During April and May last, Messrs. Dennis Fenn of Milford, and H. W. Yeomans, of Columbia, agents of the Station, visited 127 towns and villages in all parts of the State, and drew from the stock of dealers about 580 samples of commercial fertilizers. These samples have been analyzed during the Spring and Summer, and on the following pages are tabulated the analyses of all the mixed commercial fertilizers sampled by these agents.

For convenience the fertilizers are divided into two groups, viz : I. Nitrogenous Superphosphates and Guanos. II. Special Manures. The last named are simply nitrogenous superphosphates, which are claimed by their manufacturers to be specially adapted to the needs of particular crops. Of some brands a considerable number of samples were drawn. In each case of this kind a mixture of equal portions of all the samples drawn was prepared and the analysis was made on this mixture.

In the tables, with the *dealers'* quotations is also given for comparison the *manufacturers'* statements of the average retail cash price per ton in the State, in all cases where the manufacturer supplied such a statement.

The differences in the prices asked for the same fertilizers, seen in the quotations of different dealers, are due to differences in freight rates, competition, etc. Some manufacturers arrange with their agents to sell a given brand at a uniform price everywhere, but usually the retailer fixes the price.

The last column in the tables of analyses is "Percentage Difference between Cost and Valuation." Its significance may be seen by noticing the third analysis in the table on page 18, No. 2557. The cost is \$38, the valuation is \$36.31 and the difference between them is \$2.69. By multiplying this difference 2.69, by

100, and dividing it by the valuation \$36.31, we get 4.6, the percentage advance of selling price over valuation, which advance should represent on the average, the costs and profits of the manufacturer in converting the raw materials into a mixed fertilizer, selling it and collecting on his sales.

#### I. NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY STATION AGENTS.

*For analyses and valuations, see pages 11-20.*

*Guarantees.*—The analyses of 21 superphosphates out of the 47, show that their composition is below the maker's minimum guarantee in one or more particulars. Eleven are deficient in one ingredient; eight in two, and two in all the three ingredients. In most cases the deficiency is due to a misleading, and in this State *illegal*, method of expressing the guarantee of potash.

It is required, under the law, that the quantity of *actual* potash shall be expressly stated. "Potash, Sulphate, 4 per cent." means four per cent. of *actual potash* in the form of sulphate, and not 2.16 per cent. of potash, but the expression is often used by manufacturers, when only the smaller quantity of *actual* potash is present in the fertilizer. Such use is deceptive.

*Fish and Potash.*—The analyses of this material, which in past years has been a favorite fertilizer in this State, though included among the nitrogenous superphosphates are also tabulated by themselves on page 21. Most of the brands are not simple mixtures of fish scrap and potash salts, as the name would imply, but contain added phosphates and in one case, No. 2600, more than 4.5 per cent. of insoluble phosphoric acid.

*Cost and Valuation.*—In only one case has the valuation exceeded the cost.

The average cost of the 47 Nitrogenous Superphosphates has been \$34.73 and the average valuation \$29.23. The difference is \$5.50 and the Percentage Difference between cost and valuation 19.1.

That is, the same quantities of nitrogen, phosphoric acid and potash, which were contained in an average ton of Nitrogenous Superphosphate could have been bought in raw materials of standard quality in ton lots in this State for \$29.23 cash, in the average Superphosphate they cost \$34.73, and hence the manufacturers' and dealers' expenses and profits on a ton of fertilizer averaged \$5.50 or 19.1 per cent. of the cost of the materials.

The percentage difference between cost and valuation has been smaller this year than in any year since the present system of valuation has been used, as the following table shows :—

Year.	Average Cost.	Average Valuation.	Percentage Difference.
1889-----	34.73	29.23	19.1
1888-----	34.55	28.79	20.2
1887-----	35.74	28.44	25.6
1886-----	36.58	29.42	24.3
1885-----	37.60	30.47	23.4
1884-----	40.73	33.13	22.9

*Notes on particular analyses.*—The analysis of Ludlam's Cereal Fertilizer No. 2487 having been unsatisfactory to the manufacturer another analysis was made, No. 2602, on different samples collected by our Agents. The two analyses given in the tables show substantial agreement.

## II. SPECIAL MANURES, SAMPLED BY STATION AGENTS.

*For Analyses and Valuations see pages 22-27.*

Here are included such Nitrogenous Superphosphates as are claimed by their manufacturers to be specially adapted to the needs of particular crops.

*Guarantees.*—Of the twenty-nine samples analyzed fifteen are below the maker's minimum guarantee as regards one ingredient and two are below guarantee on two ingredients.

*Cost and Valuation.*—In four cases the valuation exceeded the cost.

The average cost of 29 special manures has been \$40.13 and the average valuation \$35.40. The difference between cost and valuation has been \$4.73 and the Percentage Difference 13.4. The corresponding difference in case of the superphosphates (see page 8) was 19.1 per cent.

This year, as heretofore, the Special Manures as a class have been higher-priced and more concentrated than the other nitrogenous superphosphates, and if the quality of the raw materials composing them is equally good, more economical to purchase.

The percentage difference between cost and valuation has been less the last year than in any year since 1884, when the present system of valuation was adopted, as the following statement shows :—

Year.	Average Cost.	Average Valuation.	Percentage Difference.
1889.....	\$40.13	\$35.40	13.4
1888.....	39.47	33.99	16.1
1887.....	42.52	35.20	20.9
1886.....	42.56	36.70	16.0
1885.....	44.80	38.70	16.0
1884.....	49.95	44.20	13.0

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealer's cash price per ton.	Manufacturer's statement of average cash price per ton.
2583	Quinnipiac Dry Ground Fish.	Quinnipiac Co., New London.	H. K. Brainard, Thompsonville. D. C. Wood, Stratford. Manufacturer. Olds & Whipple, Hartford. Martin Bros., Wallingford.	\$36.00 40.00 36.00 38.00 19.00 -----	\$36.00 40.00 36.00 38.00 19.00 -----
2556	Fish and Potash, Pequot Brand.	Quinnipiac Co., New London.	Mapes' Formula and Peruvian Guano Co., 158 Front St., N. Y.	40.00	\$40.00
2573	Peruvian Guano.	M. L. Shoemaker & Co., Phila., Pa.	F. Ellsworth, Hartford. J. P. Barstow & Co., Norwich.	38.00 37.00	38.00 37.00
2557	Swift-Sure Superphosphate.	L. Sanderson, 87 Long Wharf, New Haven.	W. H. Hammond, Elliott. (Purchaser). E. B. Clark, Milford. Martin Bros., Wallingford. Olds & Whipple, Hartford.	----- 35.00 30.00 30.00	----- 35.00 30.00 35.00
2464	Sanderson's Formula.	Pine Island Phosphate.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	31.00	31.00
2555	Pine Island Phosphate.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	R. A. Parker, Warehouse Point. W. B. Martin, Rockville. Carter & Strong, Manchester. F. S. Bidwell, Windsor Locks. J. H. Fish, Newington.	33.00 35.00 32.25 35.00 31.00 31.00	33.00 35.00 32.25 35.00 31.00 31.00
2524	Fish and Potash, Anchor Brand.	Cumberland Bone Co., Portland, Me.	A. P. Smith, Lebanon. W. E. Wheeler, Jr., Mystic. L. D. Post, Andover.	35.00 35.00 36.00	35.00 35.00 36.00
2535	Bowker's Fish and Potash.	Mapes' Formula and Peruvian Guano Co., 158 Front St., N. Y.	W. H. Childs, Manchester. Southington Lumber and Feed Co., Southington.	39.00 40.00	39.00 38.00
2508	Cumberland Superphosphate.	Complete Manure, for general use.			
2517					

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—Continued.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealer's cash price per ton.	Manufacturers' statement of average cash price per ton.
2553	Fish and Potash.	Orient Guano Mfg. Co., Orient, L. I.	E. A. Buck & Co., Willimantic.	\$35.00	-----
2604	Harvest Queen Phosphate.	H. S. Miller & Co., Newark, N. J.	Geo. W. Andrews, Naugatuck.	30.90	-----
2621	Meyer's Acme Fertilizer, "E" Brand.	C. Meyer, Jr., Maspeth, L. I.	Gilbert Thompson, Essex.	34.00	-----
2510	Complete Manure, "A" Brand.	A. S. Russell & Co., Meriden.	A. N. Clark, Milford.	32.00	-----
2518	Standard Fertilizer.	Mapes' Formula and Peruvian Guano Co., 155 Front St., N. Y.	A. S. Russell & Co., Meriden.	33.00	-----
2414	Quinnipiac Phosphate.	Lister's Agricultural Chem. Works, Newark, N. J.	Wilson & Burn, Middletown.	36.00	\$36.00
		Quinnipiac Co., New London, Ct.	Birdsey & Foster, Meriden.	37.00*	-----
			Mapes Branch, Hartford.	36.00	-----
			S. J. Hall, Meriden.	30.00	32.50
2520	Animal Fertilizer.	L. B. Darling Fertilizer Co., Pawtucket, R. I.	R. W. Burchard, Darien.	38.00	-----
2536	A. A. Ammoniated Superphosphate.	H. J. Baker & Bro., 215 Pearl St., N. Y.	Jas. P. Little, Columbia.	36.00	-----
			J. M. Belden, New Britain.	36.00	-----
			Olds & Whipple, Hartford.	38.00	-----
			Chandler & Morse, Putnam.	34.00	-----
			W. W. Cooper, Suffield.	38.00	-----
			D. C. Wood, Stratford.	37.00	-----
			E. N. Pierce & Co., Plainville.	37.00	-----
			E. A. Godfrey, Southport.	36.00	-----
			Waldo Tillinghast, Plainfield.	36.00	-----
			W. W. Cooper, Suffield.	38.00	-----
			Buckland & Hardin, Glastonbury.	37.50	-----
			W. T. Gregory & Co., Milford.	37.50	-----
			E. J. Dickerman, Mt. Carmel.	36.75	-----
			D. N. Benton, Guilford.	36.00	-----
			W. F. Andross, East Hartford.	37.50	-----
			C. J. Porter, Goshen.	37.50	-----
			E. H. Talcott, Torrington.	36.00	-----
			J. H. Ives, Danbury	37.50	-----

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—Continued.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealer's cash price per ton.	Manufacturers' statement of average cash price per ton.
2479	Farmers' New Method Fertilizer.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	R. A. Parker, Warehouse Point. Prentiss & Young, Norwich. F. S. Bidwell, Windsor Locks. W. W. Cooper, Suffield.	\$33.00 32.00 30.00 33.00	\$32.00
2558	Fish and Potash.	Pacific Guano Co., Boston, Mass.	D. N. Clark & Sons, Milford. C. V. DeWolf, South Manchester. R. S. Woodford, Plainville. H. A. Stillman, Hartford. A. S. Russell & Co., Meriden.	33.00 32.00 30.00 35.00	27.00
2523	Bradley's Sea Fowl Guano.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	W. W. Cooper, Suffield. F. S. Bidwell, Windsor Locks.	35.00 32.00	-----
2600	Chittenden's Fish and Potash.	National Fertilizer Co., Bridgeport.	J. P. Burr & Co., Middletown. W. W. Cooper, Suffield.	35.00 35.00	-----
2515	Fish and Potash.	E. Frank Coe, 16 Burling Slip, N.Y.	L. H. Eldridge, Norwich.	29.00	-----
2477	Bradley's Superphosphate.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	W. T. Andrews, Orange. H. M. Rose, Milford. C. A. Sharp, Abington.	38.00 38.00 38.00	35.00
			H. A. Merriam, Warehouse Point. Dix & Welles, Wethersfield. E. N. Pierce & Co., Plainville. A. C. Sternburg, Hartford. D. N. Clark & Sons, Milford. Prentiss & Young, Norwich. S. R. Woodward, Bethany. F. S. Bidwell, Windsor Locks. W. B. Martin, Rockville. W. F. Andross, East Hartford. Raymond Bros., South Norwalk. Wheeler & Flowe, Bridgeport.	38.00 36.00 37.00 35.00 37.00 37.00 36.00 34.00 37.00 37.50 35.00 37.00	

NITROGENOUS SUPERPHOSPHATES AND GUANOS, SAMPLED BY THE STATION—Continued.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealer's cash price per ton.	Manufacturers' statement of average cash price per ton.
2482	High Grade Ammoniated Bone Superphosphate.	E. Frank Coe, 19 Burling Slip, N. Y. I. W. Denison, Mystic, Arnold Rudd, New London, Backus Bros., South Windham, J. P. Barstow & Co., Norwich, G. H. Loonis, Chestnut Hill, W. T. Andrews, Orange, Hillhouse & Taylor, Williamsonic.	H. J. Baker & Bro., 215 Pearl St., E. J. Dickerman, Mt. Carmel, N. Y.	\$33.00 33.00 ---- 32.00 35.00 30.00 38.00 31.86	\$33.00 33.00 ---- 32.00 35.00 30.00 38.00 31.86
2543	Pelican Bone Phosphate.	National Fertilizer Co., Bridgeport.	L. W. Currier, Bridgeport, W. W. Cooper, Suffield, D. G. Penfield, Danbury, E. B. Clark, Milford, Olds & Whipple, Hartford, Martin Bros., Wallingford, J. F. Silliman, New Canaan, W. W. Cooper, Suffield, E. N. Pierce & Co., Plainville, M. O. Babcock, Bradford, B. E. Johnson, Higganum.	40.00 42.00 45.00 39.00 37.00 32.00 38.00 35.00 35.00 35.00 35.00	40.00 42.00 45.00 39.00 37.00 32.00 38.00 35.00 35.00 35.00 35.00
2509	Chittenden's Complete Fertilizer.	Fish and Potash, Crossed Fishes Quinquipac Co., New London, Brand.	H. A. Stillman, Hartford, W. F. Andross, East Hartford, C. V. DeWolf, South Manchester, A. S. Russell & Co., Meriden, J. M. Beiden, New Britain, Abbott & Co., Birmingham, S. B. Wheeler, Westport.	37.50 38.00 38.00 35.00 36.00 38.00 36.00	37.50 38.00 36.00 36.00
2511		Pacific Guano Co., Boston, Mass.			
2505	Soluble Pacific Guano.				
2526	New Rival Phosphate.	Crocker Fertilizer and Chemical Co., Buffalo, N. Y.			
		W. H. Scott & Co., Pequabuck.			

NITROGENOUS SUPERPHOSPHATES AND GUANOS, SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.	Manufacturers' statement of average cash price per ton.
2546	Extra Bone Phosphate.	L. B. Darling Fertilizer Co., Pawtucket, R. I.	Geo. H. Loonis, Chestnut Hill.	\$35.00	-----
2501	Chittenden's Bone Superphosphate.	National Fertilizer Co., Bridgeport.	T. H. Eldridge, Norwich. E. B. Clark, Milford. L. W. Currier, Bridgeport. W. W. Cooper, Suffield. D. G. Penfield, Danbury. Waldo Tillinghast, Plainfield. S. Griffiths, Moosap Valley. Jas. P. Little, Columbia.	35.00 30.00 35.00 35.00 35.00 34.00 40.00 32.00	-----
2533	Original Coe's Superphosphate Line.	Bradley Fertilizer Co., 27 Kilby St. Boston, Mass.	A. P. Smith, Lebanon. Arnold Warren, Willimantic. Jas. P. Little, Columbia.	33.50 35.00 36.00	-----
2559	Standard Fertilizer.	Standard Fertilizer Co., Boston.	H. K. Brainard, Thompsonville. J. P. Barstow & Co., Norwich. R. L. Bullard, Abington. F. W. Martin, Clark's Corners.	35.00 35.00 35.00 38.00	-----
2488	Americus Superphosphate.	Williams & Clark Co., 81 Fulton Dix & Welles, Wethersfield. St., N. Y.	A. M. Bowen, Eastford. R. S. Williams, Hampton.	35.00 34.00 36.00	-----
2541	Superphosphate of Lime.	Chas. Prentice, Putnam.	W. H. Anderson, Putnam.	34.00	-----
2480	Ammoniated Dissolved Bone.	Bowker Fertilizer Co., 43 St., Boston, Mass.	W. F. Andross, East Hartford. H. A. Merrian, Rocky Hill. Cartor & Strong, Manchester.	33.00 33.00 33.00	-----
2544	Excelsior Red Brand Guano.	E. Frank Coe, 16 Burling Slip, N. Y.	D. N. Benton, Guilford.	40.00	-----

NITROGENOUS SUPERPHOSPHATES AND GUANOS, SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.	Manufacturers' statement of average cash price per ton.
2499	Bowker's Hill and Drill Phosphate.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	J. A. Paine, Danielsonville. H. E. Mead, Ridgefield. W. H. Anderson, Putnam. F. Hallock & Co., Birmingham. J. E. Leonard, Jewett City. C. E. Guild, Hampton. E. E. Fowler, Montville.	\$38.00 40.00 36.00 35.00 36.00 38.00 37.00 30.00	\$36.00
2554	Orient Complete Manure.	Orient Guano Mfg. Co., Orient, L. I.	G. W. Eaton, Bristol. A. B. Brock & Co., Willimantic. A. B. Morse, Guilford.	34.00 34.00 28.00	-----
2501	Ammoniated Bone Superphosphate.	Crocker Fertilizer and Chem. Co., Buffalo, N. Y.	R. S. Williams, Hampton. Chaudier & Morse, Putnam. H. K. Brainard, Thompsonville. J. E. Leonard, Jewett City. Waldo Tillingtonast, Plainville. S. B. Booth, Newtown.	34.00 34.00 35.00 36.00 39.00 37.00	30.00
2516	Economical Fertilizer.	Wilkinson & Co., New York.	H. P. Treat, Orange.	32.00	30.00
2528	Alkaline Bone.	E. Frank Coe, 16 Burling Slip, N. Y.	F. H. Tillingtonast, Central Village. E. C. Dennis, Stafford Springs.	31.00 30.00	-----
2547	Luddam's Cecrops Fertilizer.	Fredk Luddam, 140 Maiden Lane, N. Y.	Hilhouse & Taylor, Willimantic. A. L. Kara, Tolland. R. S. Woodford, Plainville. C. T. Leonard, Norwalk.	36.00 42.00 40.00 42.00	-----
2513	Fish and Potash, Plain Brand.	Quinnipiac Co., New London.	Starr & Bailey, Groton. Olds & Whipple, Hartford. G. S. Gillette, Cheshire. H. K. Brainard, Thompsonville.	33.00 44.00 28.60 30.00	-----
2563	Lion Special Fertilizer.	Reed Fertilizer Co., New York.	Edmund Halliday, Suffield.	40.00	-----
2599	A. Mitchell's Standard Superphosphate.	A. Mitchell, Tremley, N. J.	Smalling Bros., Killingly.	37.00	-----

NITROGENOUS SUPERPHOSPHATES AND GUANOS, SAMPLED BY THE STATION—*(Incomplete).*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.	Manufacturers' statement of average cash price per ton.
<b>2561</b>	Farmers' Friend Fertilizer.	Reed Fertilizer Co., New York.	Jas. Goldson, Warehouse Point.	\$35.00	-----
<b>2562</b>	High Grade Farmers' Friend.	Reed Fertilizer Co., New York.	Jas. Goldson, Warehouse Point.	42.00	-----
<b>2602</b>	Ludlam's Cereal Fertilizer.	Fred'k Ludlam, 140 Maiden Lane, N. Y.	Jas. P. Little, Columbia.	32.00	-----
<b>2487</b>	Ludlam's Cereal Fertilizer.	Fred'k Ludlam, 140 Maiden Lane, N. Y.	C. H. Cleveland, Brooklyn.	32.00	-----
			A. M. Bowen, Eastford.	36.00	-----
			Starr & Bailey, Groton.	34.00	-----
			Prentiss & Young, Norwich.	33.00	-----
			R. S. Williams, Hampton.	32.00	-----
<b>2560</b>	Reed's Lion Brand Superphosphate.	Reed Fertilizer Co., New York.	C. T. Leonard, Norwalk.	34.00	-----
<b>2542</b>	Bradley's Extra Fine Ground Bone with Potash.	Bradley Fertilizer Co., Boston, Mass.	R. L. Bullard, Abington.	35.00	-----
<b>2552</b>	Bradley's Fish and Potash.	A. Brand, Bradley Fertilizer Co., Boston, Mass.	Edmund Halliday, Suffield.	32.00	-----
			W. F. Andross, East Hartford.	33.00	-----
			Burts & Mead, New Canaan.	34.00	-----

ANALYSES OF NITROGENOUS SUPERPHOSPHATES SAMPLED BY THE STATION.

Station No.	Name or Brand.	Nitrogen.				Phosphoric Acid.				Potash.				Cost per Ton.	Valuation per Ton.	Percentage Difference between Cost and Valuation.		
		Nitrogen as Ammonium Nitrate.	Revertred.	Soluble.	Insoluble.	Total Found.	Guaranteed.	Found.	Guaranteed.	Found.								
2583	Quinnipiac Dry Ground Fish, Pequot Brand	-----	8.68	8.68	7.5	.84	4.59	2.33	7.76	-----	5.42	4.0	-----	-----	\$36.00	\$42.60	15.5*	
2573	Mapes' Peruvian Guano, No. 1	.06	2.25	.80	3.11	3.3	5.53	9.67	5.89	21.09	22.0	15.20	-----	3.88	4.0	.59	40.00	43.09
2557	Shoemaker's Swift Sure Superphosphate	.69	-----	2.49	3.18	2.5	7.82	3.61	3.73	15.16	-----	11.43	9.0	4.34	4.0	2.16	38.00	36.31
2464	Sanderson's Formula	.64	.06	2.54	3.24	3.3	6.30	1.63	2.24	10.17	10.0	7.93	7.0	7.24	7.0	4.51	35.00	32.82
2555	Quinnipiac Pine Island Phosphate	.58	.34	1.58	2.50	2.0	5.30	6.79	1.23	13.32	-----	12.09	9.0	1.32	1.0	1.77	32.00	29.96
2535	Bowker's Fish and Potash	.53	-----	2.47	2.47	2.3	6.65	1.72	3.46	11.83	8.0	8.37	-----	4.47	4.0	4.75	31.00	28.71
2508	Cumberland Superphosphate	-----	2.3	1.54	2.30	2.0	7.08	5.87	2.17	15.12	12.0	12.95	9.0	2.54	2.0	1.56	35.00	32.38
2517	Mapes' Complete Manure for General Use	-----	.79	2.76	3.55	3.3	7.97	2.92	1.99	12.88	10.0	10.89	8.0	4.42	4.0	2.99	39.00	35.92
2604	H. S. Miller's Harvest Queen Phosphate	-----	-----	1.76	1.76	1.2	9.80	1.61	.21	11.62	-----	11.41	10.0	2.36	1.5	.64	30.00	27.49
2621	Meyer's Acme Fertilizer, E Brand	-----	.72	1.79	2.51	2.5	4.40	4.12	1.95	10.51	-----	8.52	10.0	4.90	7.0	.38	32.50	29.68
2510	Mapes' Complete Manure, "A" Brand	.51	.56	1.96	3.03	2.5	8.06	3.17	1.32	12.55	12.0	11.23	10.0	3.18	2.5	5.24	36.00	32.62
2518	Lister's Standard Fertilizer	.33	1.54	1.87	1.2	8.34	2.63	1.48	12.45	10.0	10.97	-----	1.50	1.5	.18	30.00	27.01	11.0
2484	Quinnipiac Phosphate	.58	.41	2.05	3.04	2.5	6.15	5.82	1.14	13.11	-----	11.97	9.0	1.89	2.0	1.58	36.00	32.27
2520	Darling's Animal Fertilizer	-----	.42	2.92	3.34	3.3	4.91	3.53	2.80	11.24	10.0	8.44	-----	5.03	4.0	4.60	36.00	32.07
2536	Baker's "AA" Ammoniated Superphosphate	.09	2.02	.84	2.95	2.5	10.39	1.38	.85	12.62	10.0	11.77	-----	2.80	2.0	2.96	37.00	32.91
2479	Bradley's Farmers' New Method Fertilizer	-----	.12	1.90	2.02	2.0	8.40	2.20	1.17	11.77	10.0	10.60	-----	3.52	3.0	3.36	32.00	28.29

\* Valuation exceeds cost.

ANALYSES OF NITROGENOUS SUPERPHOSPHATES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Nitrogen.		Phosphoric Acid.		Potash.		Chlorine, Guaranteed.	Cost per Ton.	Yield per Ton.	Precentage Difference between Cost and Value.	
		Total Nitro- gen Found.	Nitrogen as Ammonium Nitrogen.	Total Found.	Insoluble.	Total Found.	Guaranteed. Found.					
2523	Bradley's Sea Fowl Guano	.63	1.75	2.38	2.5	8.12	2.91	1.97	13.00	9.0	1.83	2.0
2477	Bradley's Superphosphate	.27	.78	2.62	2.8	8.42	2.22	1.56	12.20	10.64	2.16	1.5
2482	E. Frank Coe's High Grade Ammoniated Bone Superphosphate	—	—	—	—	—	—	—	—	—	—	—
2543	Baker's Pelican Bone Phosphate	.67	1.58	2.25	2.0	9.11	1.27	1.57	11.95	11.0	10.38	—
2509	Chittenden's Complete Fertilizer	.18	—	3.09	3.27	2.8	5.48	4.80	3.26	13.54	8.0	10.28
2505	Soluble Pacific Guano	.23	2.68	2.91	2.8	7.15	2.25	1.60	11.00	10.5	9.40	—
2526	Crocker's New Rival Phosphate	.09	—	1.42	1.51	1.0	8.49	2.08	.95	11.52	—	10.0
2546	Darling's Extra Bone Phosphate	.80	1.90	2.70	2.5	5.67	3.16	3.13	11.96	10.0	8.83	—
2504	Chittenden's Bone Superphosphate	—	—	2.22	2.22	2.8	6.84	4.16	2.24	13.24	10.0	11.00
2533	Original Coe's Superphosphate of Lime	—	—	2.20	2.20	2.1	7.71	2.04	2.00	11.75	10.0	9.75
2559	Standard Fertilizer	—	—	1.99	1.99	2.0	7.71	2.65	2.77	13.13	10.0	10.36
2488	Williams & Clark's American Superphosphate	.91	1.46	2.37	2.0	9.25	1.66	.15	11.06	11.0	10.91	10.0
2541	Chas. Prentice's Superphosphate of Lime	—	—	1.09	2.18	2.0	3.02	5.56	6.34	14.92	—	8.58
2480	Bowker's Ammoniated Disolved Bone	.47	1.20	.29	1.96	2.0	7.89	1.88	2.76	12.53	11.0	9.77

ANALYSES OF NITROGENOUS SUPERPHOSPHATES SAMPLED BY THE STATION—Continued.

Station No.	Name or Brand.	Nitrogen.				Phosphoric Acid.				Potash.									
		Nitrogen as Ammonium.	Nitrogen as Organic.	Total Nitro.	Guaranteed.	Soluble.	Revertred.	Total Found.	Guaranteed.	Pound.	Guaranteed.	Found.	Chlorine.	Valuation per Ton.					
2544	E. Frank Coe's Excelsior Red Brand Gano	.76	2.48	3.24	1.0	.76	.79	1.04	9.43	10.0	8.39	7.0	5.53	11.0	.74	\$10.00	\$22.56	22.8	
2499	Bowler's Hill and Drill Phosphate	.68	2.05	2.73	2.5	7.67	2.66	2.42	12.75	12.0	10.33	---	1.75	2.0	1.80	36.00	29.29	22.9	
2554	Orient Complete Manure	.29	1.39	1.68	1.6	7.83	1.78	.76	10.37	7.0	9.51	8.0	1.55	1.0	1.53	29.00	23.44	23.7	
2501	Crocker's Ammoniated Bone Superphosphate	---	3.00	3.00	2.9	7.55	2.17	1.80	11.52	8.0	9.72	8.0	1.40	1.0	1.47	36.00	29.08	23.8	
2516	Wilkinson's Economical Fertilizer	---	1.67	1.67	1.6	7.72	2.44	1.48	11.64	7.0	10.16	---	2.11	3.0	.25	32.00	25.69	24.6	
2528	E. Frank Coe's Alkaline Bone	.65	.46	1.94	3.05	3.3	7.48	1.94	1.46	10.88	---	11.13	9.0	1.86	1.8	.27	32.00	25.25	26.7
2547	Ludlam's Octoys Fertilizer	---	2.78	2.78	2.5	6.50	2.29	1.14	9.93	10.0	8.79	8.0	5.49	10.0	6.43	42.00	32.79	28.0	
2563	Reed's Lion Special Fertilizer	.32	.28	1.22	1.82	2.5	8.84	2.56	.37	11.77	---	11.40	9.0	1.89	2.5	----	37.00	27.26	35.7
2599	Mitchell's Standard Super-phosphate	---	2.14	2.14	2.1	6.84	2.72	1.64	11.20	11.0	9.56	9.0	1.86	4.0	2.31	35.00	25.80	35.7	
2561	Reed's Farmers' Friend Fertilizer	---	2.14	2.14	2.1	6.84	2.72	1.64	11.20	11.0	9.56	9.0	1.86	4.0	2.31	35.00	25.80	35.7	
2562	Reed's High Grade Farmers' Friend Fertilizer	.29	3.09	3.38	3.3	3.68	1.32	1.23	6.23	6.0	5.00	5.0	10.01	11.0	8.68	42.00	30.46	37.8	
2602	Ludlam's Cereal Fertilizer	---	1.09	1.09	1.0	7.48	2.09	4.09	13.66	11.0	9.57	10.0	1.43	4.0	3.39	32.00	22.98	39.2	
2487	Ludlam's Cereal Fertilizer	.22	.75	.97	1.0	8.85	1.36	2.76	12.97	11.0	10.21	10.0	1.66	4.0	4.21	32.00	22.95	39.4	
2560	Reed's Lion Brand Super-phosphate	---	1.16	1.16	.8	6.57	1.65	1.15	9.37	10.0	8.12	8.0	3.90	8.0	5.03	32.00	21.67	47.6	
2542	Bradley's Extra Fine Ground Bone with Potash	.08	.29	1.60	1.97	1.9	2.45	4.00	4.35	10.80	9.1	6.45	----	2.21	2.0	5.95	34.00	21.97	54.8

FISH AND POTASH.—SAMPLED BY THE STATION.

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Quinhipie Pedment.	Bradley's Anchor	BowlKer's.	Oreder.	Pacific Guano	Chittenden's.	Coop's.	Quinhipie Fishes	Grimmipie Brand,	Bradley's A	Bread.	Bradley's
2556	2524	2535	2553	2558	2600	2545	2514	2513	2552	.51	.18
Nitrogen as Ammonia .....	.44	.12	---	---	.28	.29	---	.50	.51	2.64	2.41
Nitrogen, Organic .....	2.15	3.32	2.47	3.42	2.25	2.97	2.47	3.48	3.48	1.94	1.94
Soluble Phosphoric Acid .....	.32	5.34	6.65	5.20	5.14	.94	6.03	2.54	.89	3.33	3.16
Reverted Phosphoric Acid .....	3.70	1.78	1.72	1.17	3.51	5.81	1.80	1.68	1.38	1.50	1.50
Insoluble Phosphoric Acid .....	3.12	1.76	3.46	.78	2.38	4.68	1.68	1.38	1.38	1.99	1.99
Potash .....	4.59	3.81	4.47	9.60	4.90	5.39	2.19	4.57	4.06	4.31	4.31
Cost .....	\$19.00	\$31.00	\$31.00	\$35.00	\$33.00	\$35.00	\$29.00	\$35.00	\$30.00	\$34.00	\$30.00
Valuation .....	\$21.90	\$28.78	\$28.71	\$32.19	\$28.83	\$30.07	\$24.72	\$29.12	\$22.91	\$20.26	\$20.26
Nitrogen found .....	2.59	3.44	2.47	3.42	2.50	3.21	2.47	3.98	3.15	2.59	2.59
Nitrogen guaranteed .....	2.5	3.3	2.3	3.3	3.0	3.3	3.00	3.5	2.0	2.0	2.0
Phosphoric Acid found .....	7.14	8.88	11.83	7.15	11.03	11.43	9.51	7.25	5.94	5.43	5.43
Phosphoric Acid guaranteed .....	---	5.00	8.0	---	6.0	6.0	6.0	5.0	6.0	---	---
Potash found .....	4.59	3.81	4.47	9.60	4.90	5.39	2.19	4.57	4.06	4.31	4.31
Potash guaranteed .....	4.0	3.0	4.0	14.0	4.0	5.0	3.0	4.0	4.0	4.0	4.0

SPECIAL MANURES SAMPLED BY THE STATION.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.	Manufacturers' statement of average cash price per ton.
2437	Fairchild's Formula for Seeding Down.	The Rogers & Hubbard Co., Mid-deltown.		\$40.00	\$40.00
2603	Special Potato Manure.	H. S. Miller & Co., Newark, N. J.	R. W. Cowles, Plantsville.	40.00	-----
2432	The Rogers & Hubbard Co.'s Complete Potato and Tobacco Manure.	The Rogers & Hubbard Co., Mid-deltown.	R. W. Cowles, Plantsville.	47.50	47.50
2433	Fairchild's Formula for Corn and General Crops.	The Rogers & Hubbard Co., Mid-deltown.	R. W. Cowles, Plantsville.	46.00	46.00
2540	Fruit and Vine Manure.	Mapes' Formula & Peruvian Guano Mapes' Branch, Hartford.		38.00	38.00
2321	Ammoniated Wheat and Corn Phosphate.	Crocker Fertilizer & Chemical Co., John Bru, Naugatuck, Buffalo, N. Y.	E. N. Pierce & Co., Plainville.	38.00	-----
2503	Mapes' Corn Manure.	Mapes' Formula & Peruvian Guano Mapes' Branch, Hartford.	Wm. C. Russell, Orange.	36.00	34.90
		Co., 158 Front St., N. Y.	John Dean & Horton, Stamford.	42.00	41.00
			A. W. Northrop, Ridgefield.	43.00	
			Birdsey & Foster, Meriden.	42.00	
			S. Griffiths, Moosup Valley.	43.00	
			Wilson & Burr, Middletown.	41.00	
			Mapes' Branch, Hartford.	41.00	
			Geo. K. Nason, Willimantic.	42.00	
			J. P. Barstow & Co., Norwich.	42.00	
2548	Grass and Gram Spring Top Dressing.	Mapes' Formula & Peruvian Guano Mapes' Branch, Hartford.		41.00	
2349	Tobacco Manure. Wrapper Brand.	Co., 158 Front St., New York.	C. A. McLean, Simsbury.	43.00	
		Mapes' Formula & Peruvian Guano Mapes' Branch, Hartford.	C. A. McLean, Simsbury.	48.00	48.00
2551	Complete Manure for Sandy Soil.	Co., 158 Front St., New York.	C. A. McLean, Simsbury.	50.00	
		or Mapes' Formula & Peruvian Guano Mapes' Branch, Hartford.	44.00	44.00	
2522	Complete Manure for Potatoes and Vegetables.	Co., 158 Front St., New York.	J. P. Barstow & Co., Norwich.	45.00	
		Jas. P. Little, Haddam.	42.00	40.00	
		Boston, Mass.	40.00		
		J. E. Holmes, Stratford.	42.00		

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.	Manufacturers' statement of average cash price per ton.
2483	Potato Manure.	Mapes' Formula & Peruvian Guano Co., 158 Front St., New York.	F. Hallock & Co., Darien. Wheeler & Howe, Bridgeport. Abbott & Co., Birmingham. Mapes' Branch, Hartford. E. N. Pierce & Co., Plainville. Geo. K. Nason, Willimantic. Wilson & Burr, Middletown. H. J. Baker & Bro., 215 Pearl St., A. L. Winion, Bridgeport. W. W. Cooper, Suffield.	\$45.00 45.00 45.00 46.00 43.00 43.00 44.60 43.00 42.50 42.50	\$43.00
2506	Potato Manure.	H. J. Baker & Bro., 215 Pearl St., New York.	M. T. Gregory & Co., Milford. E. F. Hawley, Newtown.	42.50	----
2531	Special Corn Manure.	H. J. Baker & Bro., 215 Pearl St., New York. Quinnipiac Co., New London.	Strong & Tanner, Winsted. W. W. Cooper, Suffield. Manufacturer.	42.00 42.50 34.00	----
2486	Potato Manure.	D. C. Wood, Stratford. E. N. Pierce & Co., Plainville. J. M. Baldwin, New Britain. Jas. P. Little, Columbia. E. A. Godfrey, Southport. Olds & Whipple, Hartford. A. N. Clark, Milford.	38.00 38.00 39.00 38.00 37.00 40.00 38.00	42.00	40.00
2622	Meyer's Acne Potato Manure.	C. Meyer, Jr., Maspeth, L. I.	Strong & Tanner, Winsted.	42.00	40.00
2530	Complete Manure for Corn and Grain.	Bradley Fertilizer Co., 27 Kirby St., Boston, Mass.			

SPECIAL MANURES SAMPLED BY THE STATION—Continued.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.	Manufacturers' statement of average cash price per ton.
2478	Bradley's Potato Manure.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	R. A. Parker, Warehouse Point. D. N. Clark & Sons, Milford. F. S. Bidwell, Windsor Locks. S. R. Woodward, Bethany. H. M. Rose, Milford. W. W. Cooper, Suffield. W. F. Andross, East Hartford. Bobt Payne, Woodbridge. E. N. Pierce & Co., Plainville. Prentiss & Young, Norwalk. Waterbury & June, Greenwich. James P. Little, Columbia.	\$38.00 37.00 35.00 37.00 38.00 36.00 38.00 37.00 38.00 40.00 38.00 36.00	----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----
2502	Potato, Hop and Tobacco Fertilizer.	Crocker Fertilizer & Chemical Co., Buffalo, N. Y.	J. E. Leonard, Jewett City. H. K. Brainerd, Thompsonville. Wm. C. Russell, Orange. R. S. Williams, Hampton. J. M. Belden, New Britain. E. N. Pierce & Co., Plainville. R. W. Burchard, Darien.	36.00 36.00 36.00 36.00 36.00 38.00 36.00 42.50 43.00 39.00 42.50 42.00 38.00 42.00 40.00 40.00 41.00	----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----
2481	Stockbridge Vegetable Manure.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	-	C. E. Guild, Hampton.	

SPECIAL MANURES SAMPLED BY THE STATION—*Concluded.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.	Manufacturers' statement of average cash price per ton.
2507	Stockbridge Grass Manure or Top Dressing.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	F. S. Bidwell, Windsor Locks. Carter & Strong, Manchester. W. H. Anderson, Putnam. J. A. Paine, Danielsonville.	\$42.00 43.00 42.50 42.50 42.50	-----
2532	Stockbridge Vegetable Manure.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	W. H. Anderson, Putnam. F. C. Hull, South Coventry.	42.50 43.00 43.00	-----
2519	Great Eastern Vegetable, Vine and Great Eastern Fertilizer Co., Rutland, Vt. Tobacco Fertilizer.	Rut-W. A. Snow, Columbia. F. W. Goodrich, Portland. G. T. Sanger, Canterbury.	W. A. Snow, Columbia. F. W. Goodrich, Portland. G. T. Sanger, Canterbury.	35.00 35.00 35.00	-----
2500	Stockbridge Corn Manure.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	J. A. Paine, Danielsonville. Carter & Strong, Manchester. H. E. Mead, Ridgefield.	42.50 43.00 45.00	-----
2613	Williams & Clark's Potato Phosphate.	Williams & Clark Co., 81 Fulton St., New York.	F. S. Bidwell, Windsor Locks. W. H. Anderson, Putnam. H. A. Merriam, Rocky Hill. E. C. Fowler, Montville. W. R. McDonald, Cromwell. J. P. Barstow & Co., Norwich. Atwood & Wilson, Waterbury. R. H. Hall, East Hampton. S. Griffiths, Moosup Valley. E. W. Martin, Clark's Corners.	42.00 42.50 42.00 39.00 42.50 36.00 36.00 38.00 38.00 37.00 34.00	-----
2515	Grain and Grass Fertilizer.	Great Eastern Fertilizer Co., Rutland, Vt.	Wade A. Snow, Columbia.	35.00	-----
2534	Ammoniated Wheat and Corn Phosphate.	Crocker Fertilizer & Chemical Co., Buffalo, N. Y.	G. T. Sanger, Canterbury. E. E. Cooley, Simsbury.	35.00 38.00	-----
2529	Potato Fertilizer.	E. F. Coo, Burling Slip, New York.	John Amilon & Co., Wethersfield.	40.00	-----

## ANALYSES OF SPECIAL MANURES SAMPLED BY THE STATION.

Station No.	Name or Brand.	Nitrogen.	Phosphoric Acid			Potash.			Chlorite.	Quarantine.	Cost per Ton.	Valuation per Ton.	Percentages Between Total Nitrogen and Nitrogen as Ammonia.	Percentages Between Potash and Chlorite.					
			Total Found.	Guaranteed.	Available.	Total Found.	Guaranteed.	Found.											
2437	Fairchild's Formula for Seeding Down	.29	2.89	.25	---	18.54	17.5	---	13.12	12.5	10.00	\$40.00	\$45.30	11.7*					
2603	H. S. Miller's Special Potato Manure	4.22	4.22	3.7	6.57	.58	.23	7.38	---	7.15	.85	7.71	7.0	trace	40.00	44.64	10.4*		
2432	Rogers & Hubbard Co's Complete Potato and Tobacco Manure	3.16	2.24	5.40	5.0	---	---	15.74	14.5	---	---	9.89	10.0	none	47.50	50.82	6.5*		
2433	Fairchild's Formula for Corn and General Crops	3.13	2.30	5.43	5.5	---	---	14.63	12.5	---	---	11.61	12.5	8.70	46.00	47.60	3.4*		
2540	Mapes' Fruit and Vine Manure	.57	1.66	2.62	1.6	17.72	1.61	.90	10.23	7.0	9.33	---	10.30	11.0	none	38.00	37.47	1.4	
2521	Crocker's Ammon. Wheat and Corn Phosphate	.39	2.47	2.47	2.0	8.96	1.83	.64	11.43	---	10.79	10.0	2.33	1.8	1.26	36.00	29.15	2.3	
2503	Mapes' Corn Manure	.93	1.32	1.71	3.96	3.7	7.89	3.23	1.55	12.67	10.0	11.12	---	6.58	7.0	5.89	41.00	39.00	5.1
2518	Mapes' Grass and Grain Spring Top Dressing	1.13	1.68	1.81	4.62	4.1	5.93	3.45	2.65	12.03	7.0	9.38	5.0	5.97	5.0	5.08	41.00	38.73	5.8
2549	Mapes' Tobacco Manure, Wrangler Brand	.65	4.17	1.47	6.29	6.2	1.89	2.51	1.55	5.95	4.5	4.40	---	11.71	10.5	1.24	48.00	44.92	6.8
2551	Mapes' Complete Manure for Light or Sandy Soil	.85	2.21	2.44	5.50	4.9	5.94	2.82	1.48	10.24	---	8.76	6.0	6.40	6.0	6.45	44.00	40.93	7.5
2522	Bradley's Complete Manure for Potatoes and Vegetables	.47	.34	2.96	3.77	3.7	8.25	2.14	.79	11.18	9.0	10.39	8.0	5.61	6.0	5.54	40.00	36.07	10.9
2453	Mapes' Potato Manure	1.08	1.25	1.50	3.83	3.7	6.12	3.40	1.95	11.47	8.0	9.52	8.0	7.17	6.0	3.8	43.00	38.63	11.3
2506	Baker's Potato Manure	2.82	1.21	4.03	3.3	6.66	1.32	.72	8.70	---	7.98	5.8	9.39	10.0	3.94	42.50	38.08	11.6	
2531	Baker's Special Corn Manure	3.78	.87	4.65	4.9	6.61	1.04	.96	8.61	---	7.65	6.3	7.87	7.0	8.28	42.50	37.47	13.4	

\* Valuation exceeds cost.

ANALYSES OF SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Nitrogen.						Phosphoric Acid.						Potash.						Guaranteed.						
		Ammonium Nitrogen as Nitrates.			Ammonium Nitrogen as Organic.			Soluble Nitrogen.			Insoluble Nitrogen.			Total Found.			Found.			Guaranteed.			Chlorine.			
		Total Nitrogen	Nitrogen as Ammonium Nitrate	Nitrogen as Organic	Total Nitrogen	Nitrogen as Ammonium Nitrate	Nitrogen as Organic	Total Found.	Nitrogen	Insoluble	Total Found.	Nitrogen	Insoluble	Total Found.	Nitrogen	Insoluble	Total Found.	Nitrogen	Insoluble	Total Found.	Nitrogen	Insoluble	Total Found.	Nitrogen	Insoluble	Total Found.
2486	Quinnipiac Potato Manure	.74	.44	2.33	3.51	2.5	3.60	4.22	1.20	9.02	----	7.82	6.0	6.98	6.0	5.9	\$38.00	\$32.79	15.8							
2622	Moyer's Acme Potato Manure	.....	1.58	1.07	2.65	2.9	3.83	3.77	1.49	9.09	7.0	7.60	----	8.92	9.0	3.99	38.00	31.86	19.2							
2530	Bradley's Complete Manure for Corn and Grain	.....	.38	.53	2.21	3.12	3.3	7.89	2.25	1.17	11.31	10.0	10.14	8.0	8.25	6.0	5.33	4.5	5.31	40.00	33.19	20.5				
2478	Bradley's Potato Manure	.....	.12	2.54	2.66	2.5	6.25	2.00	2.33	10.55	8.0	8.25	6.0	5.16	5.0	3.73	36.00	29.21	23.2							
2502	Crocker's Potato, Hop and Tobacco Fertilizer	.....	.....	2.12	2.12	2.0	8.72	2.09	.78	11.59	----	10.81	8.0	8.98	8.5	3.79	36.00	29.20	23.2							
2481	Stockbridge Vegetable Manure	.....	.58	.71	1.83	3.12	3.2	7.29	2.19	1.58	11.06	8.0	9.48	7.0	6.45	5.0	6.68	41.00	33.23	23.4						
2507	Stockbridge Grass Manure for Top Dressing	2.37	.....	2.02	4.39	5.0	5.21	1.91	3.48	10.60	6.0	7.12	3.0	4.72	5.0	4.75	41.00	33.20	23.5							
2532	Stockbridge Vegetable Manure	.20	1.09	1.93	3.22	3.2	7.34	2.17	1.47	10.98	8.0	9.51	7.0	5.59	5.0	5.37	41.00	33.06	24.0							
2519	Great Eastern Vegetable, Vine and Tobacco Fertilizer	.....	.21	1.91	2.12	2.1	6.34	2.50	1.61	10.45	----	8.84	8.0	5.84	6.0	5.00	35.00	28.18	24.2							
2509	Stockbridge Corn Manure	1.03	.....	2.32	3.35	3.2	6.06	3.85	2.87	12.78	9.0	9.91	8.0	3.45	4.0	3.62	41.00	32.63	25.6							
2613	Williams & Clark Co's Potato Phosphate	.....	.94	1.54	2.48	2.0	6.76	1.00	.22	7.98	8.0	7.76	7.0	5.83	6.0	3.53	36.00	27.46	31.1							
2515	Great Eastern Grain and Grass Fertilizer	.....	.....	2.63	2.63	2.9	6.65	2.34	1.32	10.31	----	8.99	8.0	1.87	2.0	1.98	35.00	26.61	31.5							
2534	Crocker's Ammon. Wheat and Corn Phosphate	.....	.....	2.47	2.47	2.0	8.61	1.88	.77	11.26	----	10.49	10.0	2.41	1.8	2.26	38.00	28.62	32.8							
2529	E. Frank Coe's Potato Manure	.....	.....	2.05	2.05	2.0	7.58	1.40	1.32	10.30	----	8.98	8.0	5.09	6.0	2.36	38.00	27.98	35.7							

The substance of this Bulletin may be briefly summarized as follows :—

1. Sylvanit is a potash salt containing more potash than Kainit and consists of sulphates and muriates of potash and soda, the muriates preponderating, so that it cannot fairly be called a "sulphate of potash."

2. a. Some of the samples of ashes analyzed this year were notably deficient in potash.

b. Ashes from household fires in New England as a rule contain more potash and phosphoric acid than Canadian or Western ashes.

c. A large part of ashes, leached as well as unleached, consists of carbonate of lime, which may benefit land in three ways :

First : It binds loose soils and makes them hold moisture, and on the other hand makes clay soils less stiff.

Second : It corrects "sourness" in the soil, caused either by soluble iron salts or mineral acids.

Third : It favors nitrification.

d. Hence the value of ashes never wholly, nor always chiefly consists in the plant food which they contain.

e. It is possible that a heavy application of *unleached* ashes might injure a heavy clay soil by reason of the alkali in them.

3. a. The analyses of seventy-six mixed commercial fertilizers are given in this Bulletin. In 27 of them the percentage of one ingredient is below the minimum quantity guaranteed by the maker. In 12 others two ingredients are deficient and in 5 others, all three,—nitrogen, phosphoric acid and potash—are deficient as compared with the guaranty.

b. The average percentage difference between cost and valuation this year has been 19.1 for superphosphates and guanos and 13.4 for special manures which is lower than in any year since 1884.



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